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THE MORPHOLOGY AND RELATIONSHIPS OF PODOMITRIUM MALACCENSE. (STEPH.)

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Presented to the Academy, October 30, 1914

There are but two species of the liverwort, Podomitrium, *P. phyllanthus*, a common species of the Australian region, and *P. malaccense*, which according to Stephani is known only from Singapore and New Caledonia. The writer collected the latter species in Sarawak, Borneo, in February, 1913, and also at one station in Luzon, in May of the same year. The plant is common in Sarawak, and sufficient material was secured to make a pretty complete study of its structure, which has not been done before.

Podomitrium is often included in the genus Hymenophytum, but it is certainly generically distinct.

The sterile plants of *P. malaccense* resemble exactly certain species of Blyttia, and the plant can only certainly be recognized when it bears the reproductive organs. Fertile plants, however, are immediately distinguishable by the position of the reproductive organs, which instead of being borne on the dorsal surface of the ordinary shoots, are formed upon the special branches which grow from the side of the midrib upon the ventral side of the main shoot, very much as in Metzgeria.

As in Blyttia, the thallus has a very conspicuous, and sharply delimited midrib, and wings which consist of a single layer of cells. In *P. malaccense*, the thallus is usually unsymmetrical, one of the wings being almost obliterated. Rather short rhizoids occur upon the ventral side of the midrib, but these are not uniformly distributed. They occur in dense patches separated by considerable intervals which are quite free from rhizoids.

In the form of the apical cell, and in the character of the thick-walled cells which occupy the axis of the midrib, Podomitrium closely resembles Blyttia.

The fully developed plant may reach a length of about 4 cm. with a maximum width of about 4.5 mm. No cases of dichotomous branching were seen, all of the branches appearing to be of adventitious origin, springing like the sexual shoots from the sides of the midrib.

The antheridia arise in somewhat irregular rows, one on each side of the midrib of the special shoot upon which they are borne. They arise in acropetal succession, and each is covered by a scale with laciniate margins.

Both in structure and position the antheridia are much like those of some species of Blyttia, and perhaps still more like those of *Calycularia radiculosa.*

The archegonial branches are very short, and bear but one receptacle which is relatively very large. The receptical is very much like that of Blyttia, having a similar large involucre, within which is formed a second envelope, the perianth. The latter can be seen in the young receptacle as a shallow ring enclosing the group of archegonia. If one of these is fertilized, the perianth begins to grow very rapidly, and soon becomes a conspicuous tubular sheath enclosing the developing sporophyte.

The young embryo shows a conspicuous suspensor, and very closely resembles corresponding stages of the embryo of *Blyttia radiculosa.* As it develops, however, it is more like the embryo of Mörkia or Calycularia. This is shown in the development of a distinct foot, which is not so evident in Blyttia, and the capsule is less elongated than in Blyttia, resembling more nearly that of *Calycularia radiculosa,* with which it also agrees in the dehiscence of the capsule. In *P. malaccense,* the capsule opens by two completely separate valves, while in Blyttia (and it is said also in *P. phyllanthus*), there are four valves which remain united at the apex.

In the structure of the wall, and the markings of the spore membrane, *P. malaccense* much resembles a typical Blyttia.

It is evident that Podomitrium is much more like Blyttia, than like Metzgeria, and should be placed in the Blyttiaceæ, rather than Aneuraecæ.

THE FEEBLY INHIBITED. I. VIOLENT TEMPER AND ITS INHERITANCE

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Presented to the Academy, November 12, 1914

Recent studies have shown that the impulse to general mental development and the nervous 'strength' which successfully resists the stress of untoward conditions and emotional shocks have a clear hereditary basis. The hereditary factor behaves, indeed, in typical fashion. But it has often been pointed out by sociologists, who for the most part hold differences in 'conditions of life' responsible for the differences between men, that there is no evidence that the elements of moral or social behavior have a hereditary basis, and while there have not been